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РОССИЙСКОЕ АГЕНТСТВО  
ПО ПАТЕНТАМ И ТОВАРНЫМ ЗНАКАМ

**(12) ОПИСАНИЕ ИЗОБРЕТЕНИЯ К ПАТЕНТУ РОССИЙСКОЙ ФЕДЕРАЦИИ**

(21), (22) Заявка 4797019/14, 19.01.1990

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(71) Заявитель:  
Городская клиническая больница скорой  
медицинской помощи

(72) Изобретатель: Козель А.И.,  
Зельдович Б.Я., Марков А.И., Фримштейн М.И.

(73) Патентообладатель:  
Городская клиническая больница скорой  
медицинской помощи

**(54) СПОСОБ А.И.КОЗЕЛЯ ЛЕЧЕНИЯ ОСТЕОХОНДРОЗА ПОЗВОНОЧНИКА**

**(57) Реферат:**

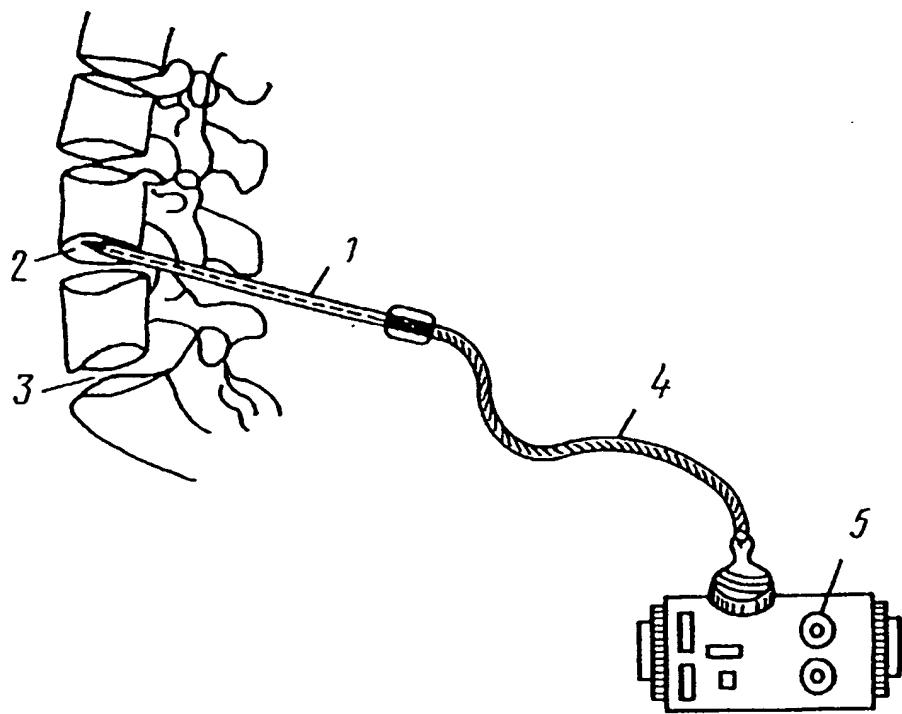
Использование: в нейрохирургии  
Сущность изобретения. в полость иглы, конец  
которой погружен в диск, вводят точечный  
источник тепла, например в другой торец  
которого направлен луч лазера и, дозируя  
энергию теплового излучения изменением

мощности источника, осуществляют тепловое  
воздействие, обеспечивая в зависимости от  
стадии заболевания заданный диапазон  
температуры прогрева пульпозного ядра и  
отведение через полость иглы продуктов  
распада ядра. Положительный эффект  
позволяет сократить срок лечения 1 мл

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FOR PATENTS AND TRADEMARKS

**(12) ABSTRACT OF INVENTION**

(21), (22) Application. 4797019/14, 19.01.1990

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(71) Applicant:  
GORODSKAJA KLINICHESKAYA BOL'NITSA  
SKOROJ MEDITSINSKOJ POMOSHCHI

(72) Inventor: KOZEL' A.I.,  
ZEL'DOVICH B.JA., MARKOV A.I., FRIMSHTEJN  
M.I.

(73) Proprietor:  
GORODSKAJA KLINICHESKAYA BOL'NITSA  
SKOROJ MEDITSINSKOJ POMOSHCHI

**(54) METHOD OF TREATING OSTEOCHONDROSIS OF VERTEBRAL COLUMN**

**(57) Abstract.**

FIELD: neurosurgery. SUBSTANCE: method involves the steps of: introducing a point heat source into a cavity of a needle the end of which is submerged into an inter vertebral disk, directing a laser beam onto the other end-face and subjecting the intervertebral disk to the action of heat by

regulating heat flux intensity from variable-power heat source providing a predetermined temperature range of warming-up pulp nucleus with regard to a disease stage and removal nucleus decay products through the needle cavity. EFFECT: reduced treatment time. 1 dwg

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The invention pertains to medicine, specifically neurosurgery.

The objective of the invention is to reduce treatment times. The method is explained by a drawing.

The patient is placed in the lying position on the left side with the knees brought to the abdomen. The damaged, for example, lumbar intervertebral disk is punctured with a hollow needle 1 90 to 120 mm long in the corresponding interspinal gap. Needle 1 is introduced to the damaged disk 2 through all the anatomical tissue layers (transdurally).

Control of the position of needle 1 in disk 2 is accomplished radiographically. The degree of degenerative changes in the pulpy nucleus 3 of disk 2 is determined by introducing 1-2 mL of a contrast agent with subsequent radiography. In grade I-II-III degenerative changes of the pulpy nucleus 3 of disk 2, a light guide 4 connected to laser unit 5 is introduced to the cavity of needle 1.

The end of the light guide 4 emerges from needle 1 by 3 mm and a light pulse is fed to it.

In grade I of the disease exposure of the pulpy nucleus 3 to this 20 W pulse is carried out for about 20 seconds, as a result of which heating of the tissues occurs with subsequent dereception (destruction of the receptor nerve endings).

In grade II of the disease the pulpy nucleus is exposed to the pulse for 25 to 27 seconds and in grade III for up to 35 seconds. The heating temperature of the disk can be monitored by a thermocouple introduced to the same needle instead of the light guide or to a separate needle.

To ensure surgical control of the temperature of the pulpy nucleus, a heated electrical temperature sensor can be used as heat source (thermocouple, thermal resistor or thermistor) placed in the same needle.

After introduction of the needle into the nucleus the needle is pushed back 3 to 5 mm and the heated sensor is advanced into the formed space. The sensor is then connected in alternation to the heating circuit and measurement circuit. The heating power is determined according to the known formula

$W = 0.24 I^2 Rt$ , where  $I$  is the heating current passing through the sensor, A;

$R$  is the resistance of the sensor, ohm;  
 $t$  is the current passage time, s.

When an electrical heat source is used, the employed equipment is significantly simplified and made cheaper and control of the power is accomplished by changing the feed voltage, whereas temperature control with the same sensor connected into the measurement circuit reduces trauma to the spine, since it eliminates the need to introduce a second needle with sensor into it.

The products of decomposition of the pulpy nucleus are removed through the cavity of the needle. A vacuum pump of known design can be used to enhance this process.

The patient should observe bed rest for three weeks. Fibrosis of the disk occurs during this time.

After this time has elapsed, the patient is generally fit for work, since all the fragments of the pulpy nucleus underwent lysis. This eliminates the hazard of complications, specifically the appearance of intervertebral swelling of the disk with development of a discoradicular conflict.

The claimed method in comparison with the prior art ensures:

- reduction of the treatment times by fibrosis of the disk;
- introduction of the given method sharply reduces the area of application of surgical methods, which in turn leads to a significant reduction in disability, which occurs in traditional surgical intervention;
- safety of the procedure because of the precise metered exposure and control;
- good tolerance of the treatment processes by the patient;
- simplicity, accessibility, minimal trauma to the spine and the absence of side effects.

Example 1. Patient V. N. Ivanishchev, 47 years old.

Diagnosis: osteochondrosis of disks C<sub>4-5</sub>, C<sub>5-6</sub> with a syndrome of cervicalgia under neuroleptan analgesia and radiographic control. A puncture with laser radiation was performed on the pulpy nucleus of disks C<sub>4-5</sub>, C<sub>5-6</sub>. Disappearance of pain was noted immediately after the operation and the patient was released in satisfactory condition in the absence of complaints after four days. Immobilization with a Schantz collar for three weeks.

Example 2. Patient S. N. Shokhin, 43 years old, suffering from osteochondrosis of the cervical section of the vertebra for 10 years. Radiographic osteochondrosis of disks C<sub>3-4</sub>, C<sub>4-5</sub>, C<sub>5-6</sub>, expressed by a cervicalgia syndrome. After disk puncture, complete regression of the pain syndrome was noted. Discharged in satisfactory condition under the observation of a neuropathologist at his residence for eight days.

Example 3. Patient S. I. Shikhon, 42 years old.

Diagnosis: osteochondrosis of disks C<sub>4-5</sub>, C<sub>5-6</sub>. Operation - disk puncture with laser on disk C<sub>4-5</sub>, C<sub>5-6</sub>. Full regression of the pain syndrome was noted and patient was released under ambulatory observation by a neuropathologist for 5 days. (56) USSR Certificate of Authorship No. 605609, class A 61 B 7/08, 1978.

#### Claim:

Method for treatment of osteochondrosis of the vertebrae by puncture of an intervertebral disk with a hollow needle and metered exposure of the pulpy nucleus, characterized by the fact that, in order to reduce the treatment period, a point heat source is introduced to the cavity of the needle, the end of which is positioned in the disk, a laser beam is directed into the other end, the energy of the thermal radiation is metered by changing the emission power, heat exposure is carried out, creating the necessary temperature for heating the pulpy nucleus and its destruction as a function of grade of the disease and removal of the products of decomposition through the cavity of the needle.